## REMARKS

### Status of Claims:

Claims 1, 11, 16, 21-22, and 28-31 are cancelled. New claims 34-38 are added. Thus, claims 2-10, 12-15, 17-20, 23-27, and 32-38 are present for examination.

### Allowable Subject Matter:

Applicant expresses appreciation to the Examiner for the indication that claims 2-10, 12-15, 17-20, 26, 27, 32, and 33 are allowed.

### Claim Rejection Under 35 U.S.C. 112:

Claims 28-31 are rejected under 35 U.S.C. 112, second paragraph.

Claims 28-31 have been cancelled and, thus, the rejection is moot.

### Claim Rejection Under 35 U.S.C. 102:

Claim 25 is rejected under 35 U.S.C. 102(e) as being anticipated by Suzuki (U.S. Patent Number 6,169,240).

With respect to claim 25, as amended, the rejection is respectfully traversed.

Independent claim 25, as amended, recites a waveform compression apparatus for compressing a plurality of temporally divided waveforms, comprising:

"a processing format specification means in which a corresponding compression processing format of **a plurality of compression processing formats** is specified for each of the plurality of temporally divided waveforms during compression, said plurality of compression processing formats including **at least two different compression processing formats**, each of the at least two different compression processing formats for compressing waveforms; and

a compression means in which compression processing is performed on each temporally divided waveform of the plurality of temporally divided

waveforms to compress the temporally divided waveform in a direction of a temporal axis <u>according to the specified corresponding compression processing format</u> to provide a corresponding resultant temporally divided waveform that is capable of being stored or reproduced." (Emphasis Added).

A waveform compression apparatus including the above-quoted features has at least the advantages that: (i) a processing format specification means specifies a <u>corresponding compression processing format</u> of a plurality of compression processing formats <u>for each of</u> a plurality of temporally divided waveforms during compression; (ii) the plurality of compression processing formats include **at least two different** compression processing <u>formats,</u> where each of the **at least two different** compression processing formats is for **compressing** waveforms; and (iii) a compression means performs compression processing on each temporally divided waveform of the plurality of temporally divided waveforms to <u>compress</u> the temporally divided waveform in a direction of a temporal axis <u>according to</u> the specified <u>corresponding compression processing format</u>.

By allowing for a processing format specification means to <u>specify</u> a corresponding compression processing format of a plurality of compression processing formats for each of a plurality of temporally divided waveforms where the plurality of compression processing formats include **at least two different** compression processing formats, it is possible to specify an **appropriate** compression processing format for each of the temporally divided waveforms. For example, **different** compression processing formats may be **appropriate** for **different types** of waveforms, such as periodic, aperiodic, intermittent, and continuous waveforms. By specifying a compression processing format that is <u>appropriate</u> for the waveform type, for example, a <u>tonal quality</u> that is expressed by the waveform following the compression can be **improved** as compared with a waveform that results from compression using a **single** compression processing format for <u>all</u> of the temporally divided waveforms. Examples of different compression and expansion processing formats are illustrated in applicant's FIGs. 1-3. (Specification; page 1, line 24 to page 2, line 15; page 2, lines 17-20; page 4, line 17 to page 5, line 17; page 24, lines 11-14).

Suzuki neither discloses nor suggests a waveform compression apparatus including the above-quoted features.

In the portion of Suzuki cited by the Examiner (col. 68, lines 1-16; col. 52, lines 5-10, 26-44, and 50-65; col. 67, lines 12-17), Suzuki describes time stretch and compress (TSC) control in accordance with a time-axis stretch/compression ratio CRate. (Suzuki; column 52, lines 4-65). In the system of Suzuki, if CRate > 1.0, then an output waveform will be compressed. (Suzuki; column 52, lines 60-65). Examples of processing performed by the system of Suzuki when CRate = 2.0 and when CRate = 1.5 are illustrated in FIG. 31 of Suzuki. (Suzuki; FIG. 31, references 412, 413; column 54, line 20 to column 56, line 30).

As shown in FIG. 31 of Suzuki, the system of Suzuki stores waveform data in data divisions. (Suzuki; FIG. 31, references 401, 411, A-F; column 53, line 60 to column 54, line 1; column 54, lines 20-35). A reproduction period in the system of Suzuki corresponds to a time period necessary for reproduction of one data division. (Suzuki; FIG. 31, references 401, 411, A-F; column 53, lines 64-66).

In the system of Suzuki, only a **single** compression process (C) is used for **all** of the data divisions that are compressed in the reproduction periods. (Suzuki; FIG. 31, reference "C"). Details of the **single** compression process (C) in the system of Suzuki are illustrated in FIG. 32 of Suzuki. (Suzuki; FIG. 32, references 513, 523, 551, 552; column 57, line 30 to column 58, line 48). As illustrated in FIG. 32 of Suzuki, the **single** compression process (C) in the system of Suzuki is carried out in a single reproduction period by reading out data of a current data division (A) pointed to by a read pointer (rp) followed by reading out data of a next data division (B) and then setting the read pointer for a next reproduction period (rp_next) at the end of the next data division (B). (Suzuki; FIG. 32, references 513, 523, 551, 552; column 57, line 63 to column 58, line 5; column 58, lines 45-48). In the system of Suzuki, the waveforms of the data divisions A and B in the compression processing are then subjected to cross-fading synthesis. (Suzuki; column 58, lines 5-8).

As is apparent from blocks 412 and 413 in FIG. 31 of Suzuki, when a compression process is performed for a reproduction period, the **same** compression process (C) is always used for the compression. (Suzuki; FIG. 31; column 55, line 19 to column 56, line 30). This is evident in FIG. 31, because when compression processing is performed for a reproduction period, the figure shows a "C" for that reproduction period, which indicates that the compression processing (C), as detailed in FIG. 32, is performed during that reproduction period. (Suzuki; FIGs. 31-32; column 55, lines 9-13). Thus, Suzuki only allows for a **single** compression process (C) and does not allow for specifying a corresponding compression processing format of a plurality of compression processing formats for each of a plurality of temporally divided waveforms where the plurality of compression processing formats include **at least two different** compression processing formats for compressing waveforms.

It should be noted that if the CRate in the system of Suzuki is set to be greater than 1.0 and less than 2.0, then the system of Suzuki may not perform the compression processing (C) in every reproduction period, but may perform the compression processing (C) in some of the reproduction periods and perform normal processing (N) in the remaining reproduction periods. (Suzuki; FIG. 31). However, it is important to understand that the **normal** processing (N) is not a process for **compression**, but rather **maintains** the reproducing time length of a data division. (Suzuki; column 54, lines 9-13). Thus, the **normal** processing (N) is not processing for **compression** and, as previously stated, the system of Suzuki only has a **single** compression process (C).

Also, the Examiner cites Suzuki (column 68, lines 1-16), so it may be worth examining what Suzuki is describing in that portion of the Suzuki patent. The system of Suzuki maintains an **ideal** readout point where readout should ideally occur and a corresponding **actual** readout point where readout is occurring, and the ideal readout point can differ from the actual readout point due to the hard boundaries created by the data divisions of the waveform in the system of Suzuki. (Suzuki; column 54, lines 2-11). The system of Suzuki is able to calculate an accumulated difference between the ideal readout point and the actual readout point in terms of a

number of data divisions, and if the accumulated difference is greater than one half of the reproduction period (diff >= 0.5) then the compression process (C) is selected, while if the accumulated difference is smaller than one half of the reproduction period then the normal process (N) is selected. Thus, the discussion in column 68, lines 1-16 simply explains how the system of Suzuki selects between the compression process (C) and the normal process (N), and does not provide for **two different** compression processes.

Therefore, independent claim 25, as amended, is neither disclosed nor suggested by the Suzuki patent and, hence, is believed to be allowable.

### Claim Rejection Under 35 U.S.C. 103:

Claims 23, 24, and 28-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki (U.S. Patent Number 6,169,240) in view of Kageyama et al. (U.S. Patent Number 5,412,152) (hereinafter Kageyama).

Claims 28-31 have been cancelled. With respect to claims 23 and 24, as amended, the rejection is respectfully traversed.

Independent claim 23, as amended, recites a waveform compression apparatus for compressing a plurality of frequency band-divided waveforms generated from an original waveform, each of the plurality of frequency band-divided waveforms comprising waveform components of a corresponding frequency band of a plurality of frequency bands, the apparatus comprising:

> "compression means with which each of the plurality of frequency band-divided waveforms is <u>apportioned to</u> a corresponding one of **at least two different kinds of compression formats** during compression, and each of the plurality of frequency band-divided waveforms is <u>compressed</u> in accordance with the <u>corresponding compression format</u> in a direction of a temporal axis to provide a corresponding compressed frequency band-divided waveform; and

> a superimposing means in which, by <u>superimposing</u> the plurality of <u>compressed frequency band-divided waveforms</u>, a resultant waveform that

-23-

corresponds to the original waveform that has been compressed in the direction of the temporal axis is formed;

wherein said resultant waveform is capable of being stored or reproduced." (Emphasis Added).

Neither Suzuki nor Kageyama, alone or in combination, disclose or suggest a waveform compression apparatus including the above-quoted features for at least the following two reasons.

First, neither Suzuki nor Kageyama, alone or in combination, disclose or suggest **apportioning** each of a plurality of frequency band-divided waveforms to a corresponding one of **at least two different kinds** of compression formats where each of the plurality of frequency band-divided waveforms is **compressed in accordance with** the corresponding compression format. As explained above in the remarks made with regard to independent claim 25, the system of Suzuki only uses a **single** compression process (C) for **all** reproduction periods in which data divisions are **compressed**. The argument that was provided above with respect to independent claim 25 also applies to independent claim 23, because a waveform compression apparatus including the above-quoted features allows for **apportioning** each of a plurality of frequency band-divided waveforms to a corresponding one of **at least two different kinds** of compression formats, which is not possible in the system of Suzuki where a **single** compression process (C) is used for all reproduction periods in which data divisions are compressed. (Suzuki; FIGs. 31-32). Moreover, Kageyama does not cure the deficiency with respect to the teaching of Suzuki, because Kageyama similarly does not allow for **apportioning** each of a plurality of frequency band-divided waveforms to a corresponding one of **at least two different kinds** of compression formats.

Second, neither Suzuki nor Kageyama, alone or in combination, disclose or suggest a superimposing means in which, by superimposing a plurality of compressed frequency band-divided waveforms, a waveform that corresponds to an original waveform that has been compressed in the direction of the temporal axis is formed. The Examiner recognizes that Suzuki, "does not specifically teach, a superimposing means in which, by superimposing the

plurality of compressed or expanded frequency band-divided waveforms, an original waveform that has been compressed or expanded in the direction of the temporal axis is formed." The Examiner then points to Kageyama (col. 7, lines 8-47) as teaching such a superimposing means.

The cited portion of Kageyama (col. 7, lines 8-47) will now be examined to show that Kageyama does not teach such a superimposing means. In column 7, lines 8-20, Kageyama discusses an **interpolation** section for performing **interpolation** on normalized frequency data and magnitude data between different tone waveforms. (Kageyama; column 7, lines 8-20). It is important to understand that **superimposing** waveforms is different than performing **interpolation** as in Kageyama. The interpolation performed by the system of Kageyama between different tone waveforms is discussed in column 20, line 48 to column 21, line 61 of Kageyama with reference to FIGs. 30 and 31 of Kageyama. In step 11 of the flowchart of FIG. 30 of Kageyama, analyzation parameters of two waveforms are **interpolated** channel by channel, which is different than **superimposing** waveforms.

In column 7, lines 21-47, Kageyama discusses a first analyzation process section for inputting a tone waveform into a plurality of band-pass filters of respective frequency bands and a second analyzation process section for, when any component corresponding to a same spectrum frequency is analyzed **across different ones** of the band-pass filters, combining magnitude data of each component associated with the same spectrum frequency. (Kageyama; column 7, lines 21-47). It is easier to understand the processing that Kageyama is describing with reference to FIGs. 33A-33E and the discussion in column 22, lines 13-38 of Kageyama. As illustrated in FIGs. 33A-33E of Kageyama, if an original spectrum Fx causes analyzation parameters **in two channels** N and N+1, then an **assignment** is made to one channel at which the magnitude is greater than that of the other channel. Such processing is only performed for a region in which the channels N and N+1 **overlap** and, thus, would not allow for superimposing waveforms in general with some parameters entirely within a **single** channel.

Therefore, independent claim 23 is neither disclosed nor suggested by the Suzuki and Kageyama patents and, hence, is believed to be allowable. Because it depends from independent

-25-

claim 23, dependent claim 24 is believed to be allowable for at least the same reasons that independent claim 23 is believed to be allowable.

In addition, dependent claim 24 recites the further distinctions:

> "wherein each of the plurality of frequency band-divided waveforms is generated from the original waveform by sampling the original waveform with a corresponding sampling frequency; and

> wherein the compression means executes compression processing for each frequency band-divided waveform of the plurality of frequency band-divided waveforms with a corresponding processing period that is based on the corresponding sampling frequency at which the original waveform was sampled to generate the frequency band-divided waveform." (Emphasis Added).

Neither Suzuki nor Kageyama, alone or in combination, disclose or suggest a waveform compression apparatus including the above-quoted distinctions where a compression means executes **compression processing** for each frequency band-divided waveform of a plurality of frequency band-divided waveforms **with a corresponding processing period that is based on a corresponding sampling frequency** at which an original waveform was sampled to generate the frequency band-divided waveform.

As explained above in the remarks made with regard to independent claim 25, the system of Suzuki only uses a **single** compression process (C) that performs compression on data divisions in reproduction periods. (Suzuki; FIG. 31). As a result, the system of Suzuki does not execute compression processing for each frequency band-divided waveform of a plurality of frequency band-divided waveforms **with a corresponding processing period that is based on a corresponding sampling frequency** at which an original waveform was sampled to generate the frequency band-divided waveform. Moreover, Kageyama does not cure the deficiency with respect to the teaching of Suzuki, because Kageyama similarly does not execute compression processing for each frequency band-divided waveform of a plurality of frequency band-divided waveforms **with a corresponding processing period that is based on a corresponding**

-26-

**sampling frequency** at which an original waveform was sampled to generate the frequency band-divided waveform.

Therefore, dependent claim 24 is believed to be allowable for at least that additional reason.

### Conclusion:

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 50-0872. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 50-0872.
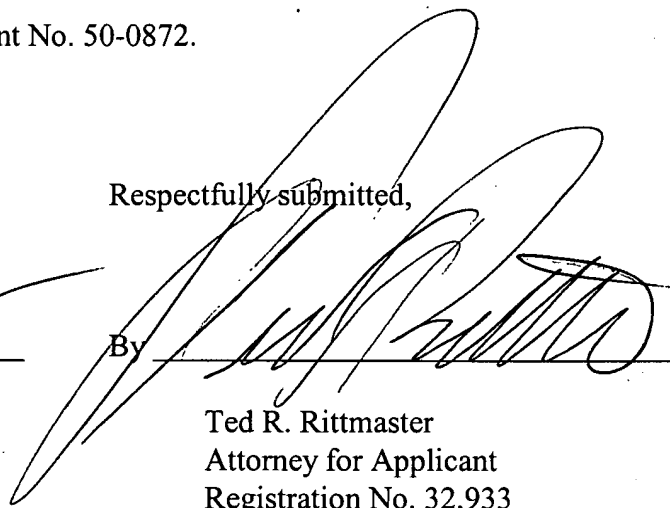
If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 50-0872.

Respectfully submitted,

Date _September 13, 2005_

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-28-